Australian Bureau of Statistics

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INTRODUCTION

23.1 This chapter provides an overview of the survey methodology used in ABS business surveys, particularly the labour-related business surveys. It should be used in conjunction with Chapter 16, which provides a broad overview of ABS survey methodology, and Chapters 24-31 which provide more detail on aspects of survey design relevant to specific labour-related business surveys.

ABS BUSINESS REGISTER

23.2 The ABS maintains an integrated register of businesses and other organisations (government departments, non-profit organisations etc.) operating in Australia (referred to as the ABS Business Register) which is the source of survey frames for most ABS surveys of businesses. The business register has about 700,000 businesses recorded on it. The largest businesses have complex operating structures which are recorded on the register, but the vast majority of businesses on the business register have simple operating structures. Information recorded on the business register includes: location of the business (State/Territory), sector (public/private), industry in which the business is mainly engaged, and its employment. Approximately 30,000 new businesses are added to the business register each quarter with a similar number ceasing to operate and being removed.

23.3 In the past, the Australian Taxation Office (ATO) was the primary source of information for detecting and adding new businesses to the register, and for identifying businesses to be removed from the register, for all industries except Agriculture[1]. When businesses registered with the ATO as new employers under the Group Employer registration process, the information about the business was passed on to the ABS. The new business was loaded to the business register, after checking that it was not already there, and following the collection of additional information about the business where necessary. Similarly, information about businesses which had their Group Employer status cancelled, or which had not remitted Group PAYE tax (on behalf of their employees) for at least five quarters, was passed on to the ABS. The business was removed from the register, following various other checks.

1. The primary source for detecting and adding new businesses to the ABS Business Register in the Agriculture industry was the agricultural census, which identified new farm businesses.

23.4 In recent times the Australian Business Register (ABR) has been established by the ATO as part of implementation of The New Tax System. In the future, the ABR will become the primary source of information for adding new businesses to the ABS Business Register, and for the removal of ceased businesses from the ABS register, across all industries. Under The New Tax System, introduced from 1 July 2000, most[2] businesses, whether employing or non-employing, need to register with the ATO for certain taxation obligations. Businesses on the ABR, along with information maintained by the ATO about those businesses, will be included on the ABS Business Register. Additional information will be collected and recorded for some businesses

(generally those with more complex operating structures). Legislation governing the allocation and use of the Australian Business Number (ABN) requires notification to the ATO of the cessation of businesses. Businesses no longer operating will be removed by the ATO from the ABR, and will then be able to be removed from the ABS Business Register.

2. The threshold for compulsory registration for GST collection and hence for an ABN (and hence recording in the ABR) is based on expected annual turnover: 'not for profit' organisations $100,000; and other businesses $50,000 (taxi operators have no threshold). Below these thresholds, there is no compulsion to register for an ABN and be recorded on the ABR. However, businesses below the threshold may volunteer to register and there are tax incentives for doing so.

23.5 Changes arising from The New Tax System, which also include significant innovations as a result of the Review of Business Taxation (Ralph Review), may impact on business structures. In order to minimise the number of disruptions to published series as a result of these wide ranging changes, the ABS aims to keep changes to a minimum until 2002 when the ABS will start using the ABR, and related information held by the ATO about the Australian business population, for its business surveys.

23.6 Until May 2002, the ABS will continue to use information from the ATO about new and ceased employer businesses to update the ABS Business Register. However, in the interim, the Group Employer registration process has been replaced by a 'Pay as You Go Withholding' registration process, which uses a concept of 'payees' rather than employment, and draws in contract labour arrangements.

SCOPE OF THE ABS BUSINESS REGISTER

23.7 In the past, the scope of the ABS Business Register was primarily based around the concept of employing businesses, defined as those clients of the Australian Taxation Office with a relationship as a Group Employer taxpayer. However, in addition to employing businesses, there were also other businesses on the register. The majority of these fell into the following categories:

- non-employing businesses with estimated value of agricultural operations greater than $5,000;

- non-employing unincorporated joint ventures;

- representatives of foreign companies operating in Australia; and

- non-employing components of employing businesses.

23.8 The interim system for updating the ABS Business Register in place between 1 July 2000 and May 2002, means that new businesses will be considered to be employing businesses and added to the ABS register if they employ 'payees'. This change is expected to have a minimal impact on the scope.

STATISTICAL UNITS DEFINED ON THE ABS BUSINESS REGISTER

23.9 A set of definitions of statistical units is used to delineate businesses for statistical purposes on the ABS Business Register. The statistical units model for economic units (businesses and other organisations) described below is the one currently in use. A revised model (not discussed below) will be used from May 2002.

23.10 The units model underlying the business register is based on the concept of the **legal**

entity[3]. Most of the administrative and other sources used to update the register relate to legal entities. However, for larger businesses in particular, several legal entities under common ownership and/or control may be operated jointly as a single 'business entity'. Large businesses may also be organised into several operating divisions for day to day management purposes, which may not be delineated along legal lines. The economic units model distinguishes between five basic units which represent the different levels of legal and management structures within a business organisation. The units identified on the ABS Business Register are described below.

Enterprise Group	The unit covering all the operations in Australia of one or more legal entities under common ownership and/or control. It includes all the operations in Australia of legal entities that are related in terms of the current corporations law. These may be companies or other legal entities such as trusts and partnerships.
Enterprise	The unit covering all legal entities within an enterprise group that are classified to the same institutional sector within the Standard Institutional Sector Classification of Australia (SISCA). For further information on SISCA refer to Chapter 15.
Management Unit	The largest type of unit within an enterprise group which controls its productive activities and for which accounts are kept. From these accounts detailed annual and sub-annual (at least quarterly) revenue, expenses, stocks, capital expenditure and employment data must be available to the ABS. The unit maintains Australian and New Zealand Standard Industrial Classification (ANZSIC) homogeneity at the sub-division (2 digit) level. For further information on ANZSIC refer to Chapter 15.
Establishment	The smallest type of accounting unit within a Management Unit, within a State or Territory, which controls its productive activities. From its accounts the full range of detailed revenue, expense, employment and stocks data must be available to the ABS at least annually. The unit maintains ANZSIC homogeneity at the class (4 digit) level. For further information on ANZSIC refer to Chapter 15.
Location	A site, occupied by an establishment, at or from which the establishment engages in productive activity on a relatively permanent basis.

3. A legal entity is a unit covering all the operations in Australia of an entity that possesses some or all of the rights and obligations of individual persons or corporations; or that behaves as such, in respect of those matters of concern for economic statistics. Examples of legal entities for statistical purposes include companies, partnerships, trusts, sole proprietorships, government departments, and statutory authorities.

23.11 The statistical unit used most commonly in the labour-related business surveys is the Management Unit/State (MUS). The MUS is not a standard statistical unit on the ABS Business Register. A separate unit is created for each State or Territory in which a Management Unit operates, and comprises all the activities of the Management Unit within that State or Territory. In nearly all cases the MUS coincides with the legal entity owning the business (i.e. company, partnership, trust, sole proprietor etc.). In the case of larger diversified businesses, however, there may be more than one Management Unit, each coinciding with a 'division' or 'line of business'. A division or line of business is recognised where separate and comprehensive financial accounts are compiled for it.

23.12 In most labour-related business surveys some large MUSs are disaggregated into 'special reporting units'. Special reporting units are created in order to collect information from the level within the business structure at which it is available. In most cases, all special reporting units for selected MUSs are enumerated. However, for some MUSs consisting of a large number of similar special reporting units, a random sample of special reporting units may be taken.

THE COMMON FRAME

23.13 Each quarter a snapshot, referred to as the common frame, of the ABS Business Register is taken. The snapshot of the register is used as the frame for all subannual business surveys covering the reference quarter for which the snapshot was extracted. This common timing ensures that populations and sampling information are consistent across all surveys with a common reference period.

NEW BUSINESS PROVISIONS

23.14 New business provisions are adjustments made to survey estimates to account for births and deaths of businesses that have occurred up to the end of the survey reference period but which are not reflected on a survey frame (e.g. because of lags in processing births and deaths of businesses to the ABS Business Register or because of births and deaths which occur after the snapshot is taken but before the end of the survey reference period). The calculation of the new business provisions makes assumptions about the number of new Pay As You Go Withholding registrants which will result in births of Management Units on the ABS Business Register, and the average contribution of these birthed units to the item being estimated. The methodology assumes that the contribution of the new business is the same as the average contribution to estimates of like units already on the frame.

SCOPE AND COVERAGE OF ABS BUSINESS SURVEYS

23.15 The scope of ABS business surveys varies across collections. Most surveys using the ABS Business Register as a frame have either an industry orientation (e.g. monthly retail surveys) or an economy-wide orientation (e.g. the Economic Activity Survey and the labour-related business surveys). The scope of surveys that use the business register as a frame is restricted by the scope and coverage of the register itself (see discussion above). Surveys with broader or different scope are required to either supplement the business register for their frame, or use frames that have been constructed independently of the register by using relevant alternative data sources.

23.16 While the scope of ABS labour-related business surveys varies across collections, most are restricted to employing businesses. However, the following groups of employing businesses are generally excluded.

- Employing businesses in the agriculture, forestry and fishing industry (ANZSIC Division A). Units in this industry are excluded, primarily because a very high proportion of agricultural enterprises have no employees. It would be disproportionately costly to survey a sufficient number of these enterprises to obtain a sample of employees large enough to adequately represent this industry.

- Private households employing staff (ANZSIC Group 970). There is incomplete coverage of private households employing staff on the ABS Business Register as not all such households are required to register with the Australian Taxation Office as Group Employers (or for Pay As You Go Withholding). It is due to their incomplete coverage on the business register that these units are excluded from the scope of the labour-related business surveys.

- Foreign embassies, consulates etc. in Australia (ANZSIC Group 813). Practical collection difficulties and the low numbers of Australian employees involved have resulted in the exclusion of this industry group from the labour-related business surveys. Furthermore, the

System of National Accounts does not consider these agencies to be resident units of the Australian economy, with the result that the associated compensation of employees (including those employees who are usual residents of Australia) is not a component of Australian GDP.

STATISTICAL UNITS USED IN ABS BUSINESS SURVEYS

23.17 The statistical units used in ABS business surveys vary across collections.

23.18 For business surveys using the ABS Business Register as a survey frame, the sampling unit most commonly used is the Management Unit. For these surveys, the sampling unit (e.g. the Management Unit) is often the same as the other statistical units (e.g. reporting and collection units) used in the survey. However, this is not always the case and in some surveys the statistical units differ.

23.19 For business surveys using alternative frames, the sampling unit used usually corresponds to one of the economic units defined on the ABS Business Register.

23.20 For labour-related business surveys, a variety of statistical units are used. As most labour-related business surveys use the ABS Business Register as their frame, the sampling unit most commonly used is the MUS. The collection and reporting units used in the labour-related business surveys usually correspond to the sampling unit.

COLLECTION METHODS USED IN ABS BUSINESS SURVEYS

23.21 Most ABS business surveys use either the mail-out/mail-back or the telephone interview collection methodology. A number of surveys use administrative by-product data. Please refer to Chapter 16 for further explanation of different collection methodologies.

23.22 Most business surveys, including the labour-related business surveys, have intensive follow-up procedures for non-response. Follow-up normally involves reminder letters and may also involve telephone contact. 'Priority' intensive follow-up is used for a number of surveys; this involves targeting the following types of non-responding units:

- units that contribute significantly to estimates;

- newly selected units (e.g. in ongoing surveys); and

- units that did not respond in the previous survey cycle.

SAMPLE DESIGN USED IN ABS BUSINESS SURVEYS

23.23 Two types of business surveys are undertaken by the ABS: censuses, and probability sample surveys. Most ABS business surveys (whether they be censuses or sample surveys), use the ABS Business Register to create their survey frame. With the exception of the Industrial Disputes collection, all labour-related business surveys construct their frame from the ABS Business Register. An independent frame is constructed each month for the Industrial Disputes collection.

23.24 Once a survey frame has been compiled, whether it be from the ABS Business Register or

another source, information is collected from businesses on the frame. In a census, information is collected from all of the units on the frame. In the case of probability sample surveys, information is collected from a sample (or subset) of units on the frame.

SAMPLE SELECTION

23.25 When a sample is to be selected for an ABS business survey, a frame must first be drawn from the common frame (see paragraph 23.13). The survey frame is then divided (stratified) into groups (strata) with similar characteristics. The stratification variables used in the labour-related business surveys include State, sector (public/private), industry and employment size. Once the frame has been stratified, a small number of strata are completely enumerated, while for each of the remaining strata an equal probability sample is taken. Surveys using multi-stage selection processes (such as the Survey of Employee Earnings and Hours) use additional steps to select their sample.

23.26 There are various constraints placed on sample selection. For most labour-related business surveys, sample selection is constrained by ensuring that the portion of the sample that is not completely enumerated is rotated, and that small businesses will be in the sample for no more than 12 successive quarters (for quarterly surveys). Some surveys are further constrained by ensuring that there is either minimal or maximal overlap with other surveys.

23.27 The level of sample rotation within surveys, and sample overlap between surveys, is controlled through the use of a system of synchronised sampling. The technique relies on assigning a permanent random number between 0 and 1 to each unit on the ABS Business Register. Samples selected from frames constructed from the ABS Business Register are restricted to those units with random numbers that lie in a certain interval. Rotation control is achieved by moving the interval to the right, and overlap is achieved by constraining the selection interval for each survey to move within a specific range within the larger (0,1) interval.

23.28 The sample size varies across ABS business surveys. In determining the minimum required sample size for each survey the following factors are taken into consideration:

- the required level of accuracy from the survey;

- the numbers of nil and defunct units on the survey frame (estimated from data obtained from other surveys);

- the expected level of non-response (estimated from previous surveys); and

- total cost and available resources.

23.29 The sample is allocated across the survey strata using techniques to minimise the variance of the estimates being produced for a fixed cost, or to minimise the cost for a fixed variance. This process is referred to as optimal allocation.

ESTIMATION METHODS USED IN ABS BUSINESS SURVEYS

23.30 Once survey data have been obtained, they must be expanded to values that represent the whole (target) population. As discussed in Chapter 16, the estimation procedure is essentially the application of weights to the individual survey records. For ABS business surveys, the values of these weights are determined with respect to one or more of the following factors:

- the probability of selection for each survey unit (probability weighting);

- adjustments to agree with population benchmarks - to correct for imbalances in the characteristics of the selected sampled units (post-stratification, ratio estimation);

- adjustments to account for problems with the survey frame - such as missing and defunct units (new business provisions); and

- adjustment for non-response - to correct for further imbalances in the characteristics of responding sample units (post-stratification).

23.31 For censuses, aggregates need to be adjusted to account for non-response and problems with the frame.

ESTIMATION

23.32 Two main types of estimates are used in surveys constructing their frame from the ABS Business Register, namely number raised estimation and ratio estimation. While some surveys rely solely on number raised estimation, most will use ratio estimation in some strata. The labour-related business surveys use stratum-by-stratum ratio estimation in strata where the benchmark information is known and sampling efficiencies achievable are greater than with number raised estimation; for strata where benchmark information is not available, number raised estimation is used. Number raised estimation and ratio estimation are discussed further in Chapter 16.

23.33 The post-stratification of the sample prior to estimation is common practice for ABS business surveys, to improve the estimation process. Post-stratification is used in the labour-related business surveys. For further explanation of post-stratification estimation see Chapter 16.

EDITING

23.34 Editing is used in ABS business surveys to correct a number of non-sampling errors such as those introduced by misunderstanding of questions or instructions, interviewer bias, miscoding, non-availability of data, incorrect transcription, non-response and non-contact. Editing can be performed both on the values collected from respondents and on the accumulated survey results as part of the estimation process.

23.35 Some labour-related business surveys use significance editing to reduce the editing load for the survey. Significance editing involves assessing each survey value to be edited against how greatly the survey estimate will be affected by using the unedited value. Only those values which will significantly affect the survey estimate are then edited through techniques such as imputation and outliering.

NON-RESPONSE ADJUSTMENT

23.36 Adjustments for non-response are made in the estimation process for all business surveys. There are three categories of non-response for ABS business surveys: partial non-response; complete non-response; and refusal. The extent to which values are imputed depends upon the amount and the quality of data already provided. Partial imputation is used when the unit has provided some data. Complete imputation is used when no data have been provided, or the respondent has refused to participate in the collection.

23.37 There are two sources from which imputed values can be derived for business surveys. The first is data provided by each unit or by a subset of units within a stratum. This may be data previously provided, or current data where partial non-respondents are able to provide some information. One specific example of this type of imputation is Beta imputation. Beta imputation is an automatic imputation procedure that involves estimating the missing values by applying a growth rate to the most recently reported data for these units, provided that data have been reported in either of the two previous quarters. Collections run on an infrequent or one-off basis will not be able to use data previously provided for imputation of a current value.

23.38 The second method derives estimates by generating a mean value for all missing data items. This method uses the Live Respondent Mean, which is used to impute for units which are known or taken to be alive, but for which no other information is available or useful. Records imputed using the 'mean' do not contribute to estimates of variance.

23.39 Another imputation technique which has been used, in the completely enumerated sector of infrequent surveys where no historical information is available, is a version of the hot-deck method where the non-responding unit gains the response values of a responding unit which has similar characteristics.

23.40 For complete non-response and refusals in completely enumerated strata, all data items for the unit are imputed, preferably using previously provided data. For complete non-response and refusals in other strata, the unit can have data items imputed using the Live Respondent Mean, although imputation based on previously provided data is preferred. Refer to Chapter 16 for further information on non-response adjustment.

OUTLIERS

23.41 Two main methods for the treatment of outliers are used in ABS Business Surveys, namely Surprise Outliering and Winsorization. For further explanation of these methods see Chapter 16.

NEW BUSINESS PROVISIONS

23.42 New business provisions are used in the estimation process to allow for births and deaths of businesses that have occurred up to the end of the survey reference period but which are not reflected on a survey frame. The provisions are determined following the creation of the common frame, but are not applied until estimation. For further information, refer to paragraph 23.14.

RESPONSE RATE

23.43 The response rate for ABS business surveys is calculated as the number of responding units divided by the total number of live units in the sample.